

parts of the host or other plants in the vicinity, upon which they germinate, under favorable conditions.

The manner of seed expulsion in this genus, as seen in some western species, has been described by D. T. MacDougal in *Minnesota Botanical Studies*, 2nd series, part ii., February 22, 1899, p. 169-173.

No opportunity was obtained for observing the actual expulsion of seed from the Boylston plants, but this was seen very well in fresh specimens growing on white spruce in Maine, kindly furnished by Dr. Hermann von Schrenk.

The mistletoe at Boylston, as yet the only known locality for it in Massachusetts, is now nearly extinct, and will soon be completely eradicated, because, in the summer of 1898, the host-plants and other trees and shrubs were cut and burned to clear the ground for surveyors, and only a few small fragments of the mistletoe-bearing host escaped alive. These will soon be obliterated, because the swamp is to be filled or thoroughly cleaned out, and the pure waters of the reservoir will eventually flow over it.

This *Arceuthobium* may be found in other localities not far away. In looking for it, the hunter will be aided by the fact that the affected host-plants often appear distorted or stunted in comparison with perfectly healthy trees.

In the accompanying plate, generously furnished by Mr. C. E. Faxon, the figures have been drawn from specimens growing on black spruce collected in the Boylston locality.

ARNOLD ARBORETUM.

EXPLANATION OF PLATE 13. — *Arceuthobium pusillum*, Pk. Fig. 1, branch of black spruce in spring, with staminate *Arceuthobium* in flower; *a*, twig one year old; *b*, twig two years old; *c*, twig three years old. Fig. 2, branch in autumn with pistillate plants and fruit; *a*, twig one year old; *b*, twig two years old showing buds of the parasite; *c*, twig three years old with full-grown *Arceuthobium*; *d*, twig four years old with fruiting plants. Fig. 3, plant with mature fruit. Fig. 4, staminate plant in flower. Fig. 5, pistillate plant in flower. Fig. 6, staminate flowers. Fig. 7, pistillate flowers. Fig. 8, the same in vertical section. Fig. 9, fruit, showing manner of dehiscence and seed expulsion. Fig. 10, seed. (Figs. 1 and 2, natural size; figs. 3 to 10, enlarged.)

ARCEUTHOBIUM PUSILLUM ON A NEW HOST IN VERMONT. — I have been confident for several years that *Arceuthobium pusillum*, Pk., must occur in Vermont. The black or swamp spruce, its usual host, is common in the sphagnum swamps of the Champlain valley and elsewhere in the state. Professor Peck finds the *Arceuthobium* in the Adirondack

regions, and Professor Hudson, of Plattsburgh, told me last year that he had found it a few miles south of that city, near the shores of Lake Champlain.

Persistent search on the Vermont side of the lake failed to show the parasite until this summer. Mr. W. W. Eggleston, of Rutland, wrote me in June that he had at last discovered it in a spruce swamp near that city. Early in August I visited a large black spruce swamp on the south end of the Alburgh peninsula, which divides the northern end of Lake Champlain into two arms. Here, at last, my own search was rewarded. A considerable per cent of the black spruce trees showed abnormal growths or "Hexenbesen" (witches' brooms). These abnormal branches, in all cases examined, were hosts of the *Arceuthobium*. No flowering or fruiting specimens of the parasite were observed at this time.

Upon again visiting the swamp the last week of September to obtain these, a similar "Hexenbesen" was observed in a medium-sized specimen of the tamarack, *Larix Americana*. Examination of this revealed scattering plants of *Arceuthobium* upon the deformed branches. The relative number of these upon the tamarack in proportion to the size of the "Hexenbesen" was small, however, probably not above one per cent of that found upon similar spruce branches. The individual plants of the parasite were of about the size and appearance of those found on the spruce. No fruiting plants occurred.

Time did not permit of much further search, and no other "Hexenbesen" was observed on tamarack. A photograph of the infested tamarack branch was made and is communicated with this article.

A number of herbarium specimens were taken of the parasite as it occurs on spruce, and I shall be glad to send these upon request to botanists who are interested in this curious plant.—L. R. JONES, Botanical Laboratory, University of Vermont.

EXPLANATION OF PLATE 14.—Witches' broom formed on *Larix Americana* as a result of the parasitism of *Arceuthobium pusillum*; from a photograph.

FURTHER NOTES UPON THE DISTRIBUTION AND HOST PLANTS OF *ARCEUTHOBIUM PUSILLUM*.—When the 6th edition of Gray's Manual was published in 1889, the tiny parasite *Arceuthobium pusillum* was known only from the Adirondacks, Hanover, New Hampshire, and Pocono Mountain, Pennsylvania. It now appears, however, to be